Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Practice Points

Mass screening of healthcare personnel for SARS-CoV-2 in the Northern Emirates

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Whereas healthcare personnel (HCP) potentially have an increased risk of infection with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the era of the pandemic, the approach to testing HCP for the virus has not been uniform [1,2]. Given the significant percentage of asymptomatic coronavirus disease 2019 (COVID-19) infection, universal testing of HCP could allow infected workers to be identified and isolated early, reduce in-hospital transmission, mitigate potential workforce depletion, and enhance healthcare workers' safety [3,4]. This study aimed to evaluate the effectiveness of the universal staff screening for COVID-19 and identify any risk factor for viral infection.

The hospital invited HCP to screen for SARS-CoV-2 three times between April 3rd and May 14th, 2020, regardless of symptoms. The presence of SARS-CoV-2 was confirmed by real-time reverse transcription–polymerase chain reaction (RT–PCR). The staff were encouraged to notify the occupational health nurse for SARS-CoV-2 test any time if they had any suspicious symptoms of COVID-19 or close contact with COVID-19 patients. Once a member of staff was confirmed as a COVID-19 case, a structured survey and contact tracing were followed.

All clinical staff in the hospital were recommended to wear a surgical mask from March 12th, 2020, onwards. External visitors were prohibited from entering the hospital, starting on March 24th, 2020. All patients were admitted to negative-pressure rooms first after routine screening RT–PCR test for SARS-CoV-2 from April 13th, 2020. COVID-19 patients were transferred to the designated COVID-19 hospitals immediately. Patient-facing staff have to use N95 respirators, face shields, gowns, and gloves until patients have two negative consecutive COVID-19 tests. The χ^2-test and Mann–Whitey test ($P < 0.05$) were used to compare paired nominal data and the continuous data, respectively. The institutional review board and research ethics committee of the Ministry of Health and Prevention granted ethical and regulatory approval.

Among 1242 employees, 1206 (97.1%) who underwent at least one test were included in the analysis (8.8% physicians, 28.4% nurses, 10.9% allied health professionals, 14.0% administrative staff, and 37.9% support staff). The screening participation rates showed decreasing trends from 93% to 72%. The median (interquartile range (IQR)) age of participants was 34.0 (30.0–40.0) years, and 528 (43.8%) were female.

There were sharp rises in the rate of positive coronavirus tests up to 4.0% and 6.3% at the second and third screening, respectively (Table I). Of 101 COVID-19 cases, 99 (98.0%) were support staff. The generalized estimating equations demonstrated that support staff were more likely to contract the infection, even after adjusting for age and sex (odds ratio: 80.6; 95% confidence interval: 20.2–320.9; $P < 0.001$). On the

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Table I
Breakdown of three screening tests for SARS-CoV-2 among healthcare personnel by sex and staff position

Staff role	Age (years), median (IQR)	Total		1st screening		2nd screening		3rd screening	
		Positive/tested	%	Positive/tested	%	Positive/tested	%	Positive/tested	%
All	34.0 (30.0–40.0)	101/1206	8.4	3/1157	0.3	42/1043	4.0	56/890	6.3
Sex									
Female	34.0 (30.0–39.0)	13/528	2.5	0/515	0	1/469	0.2	12/445	2.7
Male	35.0 (30.0–41.0)	88/678	13.0	3/642	0.5	41/574	7.1	44/445	9.9
Staff position									
Non-support staff[a]	36.0 (32.0–41.0)	2/749	0.3	0/725	0	0/687	0	2/600	0.3
Support staff[b]	32.0 (27.0–37.0)	99/457	21.7	3/432	0.7	42/356	11.8	54/290	18.6
Housekeeping staff	30.0 (26.0–33.8)	16/112	14.3	0/103	0	2/105	1.9	16/105	15.2
Porter	29.0 (25.0–37.0)	28/93	30.1	0/92	0	3/47	6.4	25/89	28.1
Security guard	34.0 (30.0–38.0)	27/81	33.3	3/81	3.7	24/54	44.4	0/5	0
Facility staff	35.0 (28.0–44.5)	17/64	26.6	0/64	0	10/55	18.2	5/12	41.7
Catering staff	31.0 (26.0–34.3)	10/55	18.2	0/54	0	2/49	4.1	8/43	18.6
Other	33.0 (29.0–36.0)	1/52	1.9	0/38	0	1/46	2.2	0/36	0

SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; IQR, interquartile range.
[a] Includes administrative staff, allied health professionals, nurses, and physicians.
[b] Includes housekeeping staff, porters, security guards, facility staff, catering staff, and 52 others.

contrary, contact tracing and symptom-based testing during the same period revealed a higher number of positive cases in the non-support staff than support staff (25/115 vs 8/213; $P < 0.001$). Nearly all staff with COVID-19 (90.9%) found in the above testing strategy were not connected through transmission, except for one small cluster.

A total of 63 HCPs completed the survey (response rate: 62.4%), with 88.3% of support staff. The median (IQR) age of responders was 32.0 (27.0–37.0) years, and 57 (90.5%) were male. Forty (63.5%) had at least one symptom over the course of the disease. Support staff shared accommodation and commuter vehicles with more colleagues than non-support staff (6.0 (IQR: 6.0–7.0) vs 1.0 (IQR: 1.0–4.0) for accommodation, $P < 0.001$; 30.0 (IQR: 22.0–34.3) vs 1.0 (IQR: 1.0–1.8) for commuter vehicles, $P < 0.001$).

As the travel ban and lockdown had been imposed since late March 2020 in the UAE, a high incidence of COVID-19 in support staff might be related to shared accommodation and crowded commuter vehicles, which is supported by the survey [5]. Most migrant workers in Gulf countries are confined to small rooms which are shared with up to a dozen workers [6]. It is comparable to the findings of the previous studies that household contact or extra-occupational exposure might have a role in transmission dynamics among HCP [7,8]. The limited accessibility of the healthcare system for these staff might also contribute to their higher infection rate. They must visit a different medical clinic when they are ill, unlike other employees.

Screening found few COVID-19 patients in the non-support staff, which implies that strict infection preventive measures could contain in-hospital transmission effectively if transmission outside hospital settings is under control. The limitation of the study is that it is hard to generalize the results due to the Middle East setting and COVID-19-free status of the institution. Also, since the screening was done during the coronavirus lockdown, the epidemiology could change when restrictions are lifted.

The proportion of asymptomatic COVID-19 cases supports the utility of the universal screening of HCP. However, as mass screening for a long time seems unsustainable, targeted screening for high-risk groups might be an alternative in the second wave of COVID-19.

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